Claims:

1. An electrode material for lithium ion batteries, characterized in that the electrode material comprises
   - 5-85% by weight of nanoscale silicon particles which have a BET surface area of from 5 to 700 m^2/g and a mean primary particle diameter of from 5 to 200 nm,
   - 0-10% by weight of conductive carbon black,
   - 5-80% by weight of graphite having a mean particle diameter of from 1 μm to 100 μm and
   - 5-25% by weight of a binder,

   the proportions of the components summing to not more than 100% by weight.

2. An electrode material according to claim 1, characterized in that the electrode material comprises
   - 65-86.5% by weight of nanoscale silicon particles,
   - 0.5-5% by weight of conductive carbon black,
   - 8-20% by weight of graphite having a mean particle diameter of from 2 μm to 50 μm and
   - 5-10% by weight of a binder.

3. An electrode material according to claim 1, characterized in that the electrode material comprises
   - 5-40% by weight of nanoscale silicon particles,
   - 55-85% by weight of graphite having a mean particle diameter of from 2 μm to 50 μm and
   - 5-10% by weight of a binder.

4. An electrode material according to at least one of claims 1 to 3, characterized in that the nanoscale silicon particles are doped.

5. An electrode material according to claim 4, characterized in that the nanoscale silicon particles comprise not more than 53% by weight of lithium as a doping component.

6. An electrode material according to at least one of claims 1 to 5, characterized in that the nanoscale silicon particles have a BET surface area of from 6 to 140 m^2/g.

7. The use of an electrode material according to at least one of claims 1 to 6 for the production of lithium ion batteries.

8. The use according to claim 7, characterized in that an electrolyte composition which comprises from 0.5 to 10% by weight of vinylene carbonate is used as the electrolyte.

9. The use according to claim 7 or 8, characterized in that an electrolyte composition comprising at least one organic solvent and at least one alkali metal salt or alkaline earth metal salt is used as the electrolyte.

10. The use according to claim 9, characterized in that an electrolyte composition which comprises an organic solvent selected from ethylene carbonate, dimethyl carbonate, ethyl methyl carbonate, diethyl carbonate, propylene carbonate, butylene carbonate, methyl propyl carbonate, butyl methyl carbonate and its isomers, 1,2-dimethoxyethane, tetrahydrofuran, 2-methyltetrahydrofuran, diethylene glycol dialkyl ester, dioxolane, propylene oxide, dimethyl sulfoxide, dimethylformamide, formamide, nitromethane, gamma-butyrolactone, alkyl esters of carboxylic acids and/or methyl lactate is used as the electrolyte.

11. The use according to claim 9 or 10, characterized in that an electrolyte composition which comprises a conductive salt selected from $LiPF_6$, $LiClO_4$, $LiAsF_6$, $LiBF_4$, $LiCF_3SO_3$, $LiN(CF_3SO_2)_2$, $LiN(SO_2CF_2CF_3)_2$, $LiSbF_6$, $LiAlCl_4$, $LiGaCl_4$, LiCl, $LiNO_3$, LiSCN, $LiO_3SCF_2CF_3$, $LiC_6F_5SO_3$, LiO_2CCF_3, $LiFSO_3$, $LiB(C_6H_5)_4$, $LiB(C_2O_4)_2$, and/or lithium fluoroalkylphosphates is used as the electrolyte.

12. The use according to at least one of claims 7 to 11, characterized in that an electrolyte composition in which the concentration of the conductive salt is from 0.5 mol/l to the solubility limit of the corresponding salt is used as the electrolyte.

13. A lithium ion battery having a negative electrode which comprises an electrode material according to at least one of claims 1 to 6.